

**AMENDMENTS TO THE CLAIMS**

**This listing of claims will replace all prior versions and listings of claims in the application:**

**LISTING OF CLAIMS:**

**Claims 1-14. (Cancelled).**

**Claim 15. (Currently amended):** A method of producing a carbon black~~solid~~  
~~carbonaceous~~ product, comprising: heating a hydrocarbon fuel comprising bulk feedstock fuel and flame fuel in the presence of oxygen at a C:O stoichiometric ratio greater than 1:0.4, to a temperature of at least about 1000°C, to thereby effect incomplete combustion and partial pyrolytic decomposition of said hydrocarbon fuel, and so as to produce a carbon black~~solid~~~~carbonaceous~~ product, wherein said carbon black~~solid~~~~carbonaceous~~ product has a C:H stoichiometric ratio of greater than 2.5:1.

**Claim 16. (Previously presented):** The method of Claim 15, wherein said C:H stoichiometric ratio exceeds 40:1.

**Claim 17. (Previously presented):** The method of Claim 15, wherein said method comprises: pre-heating said bulk feedstock fuel, and passing said bulk feedstock fuel into a reactor, wherein said bulk feedstock fuel is heated to a temperature of between about 1000 and 2000°C for between 0.1 and 10 seconds by interspersing said bulk feedstock fuel with hydrocarbon flames

generated by reaction of said flame fuel with oxygen or air, to obtain localized heating and thereby effect partial pyrolytic decomposition.

**Claim 18. (Previously presented):** The method of Claim 17, wherein said hydrocarbon flames are generated by reaction of the flame fuel with oxygen.

**Claim 19. (Previously presented):** The method of Claim 15, wherein said bulk feedstock fuel and said flame fuel are the same or different, and wherein said temperature of at least about 1000°C is achieved by combustion of the flame fuel which is mixed with, or separate to, the bulk feedstock fuel.

**Claim 20. (Previously presented):** The method of Claim 19, wherein said bulk feedstock fuel and said flame fuel are the same or different and are mixed together, and wherein said temperature of at least about 1000°C is achieved by ignition of the hydrocarbon fuel causing localized combustion of said flame fuel within said bulk feedstock fuel.

**Claim 21. (Previously presented):** The method of Claim 15, wherein the combustion products are interspersed with said feedstock fuel by the use of turbulence.

**Claim 22. (Previously presented):** The method of Claim 21, wherein said turbulence is achieved by introducing one or more of a flame, combustion products, flame gas, oxidizer, hydrocarbon fuel or feedstock fuel into a reactor at a velocity of 20-200m/s.

**Claim 23. (Previously presented):** The method of Claim 15, wherein said feedstock fuel comprises one or more gaseous hydrocarbons.

**Claim 24. (Previously presented):** The method of Claim 15, wherein said feedstock fuel is natural gas.

**Claim 25. (Currently amended):** The carbon black~~solid carbonaceous~~ product obtainable by the method of Claim 15.

**Claim 26. (Previously presented):** The method of Claim 15, wherein a hydrogen-rich gas with a H:C stoichiometric ratio equal to or exceeding 20:1, and a H:O stoichiometric ratio greater or equal to 5:1 is produced.

**Claim 27. (Previously presented):** A method of combustion comprising, combusting the hydrogen-rich gas produced according to the method of Claim 26.

**Claim 28. (Cancelled)**

**Claim 29. (Previously presented):** The method of Claim 15, wherein said hydrocarbon fuel is heated in the presence of oxygen at a C:O stoichiometric ratio greater than or equal to 1:0.2.

Amendment under 37 C.F.R. § 1.114(c)  
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**Claim 30.**     **(Previously presented):** The method of Claim 26, wherein said hydrocarbon fuel is heated in the presence of oxygen at a C:O stoichiometric ratio greater than or equal to 1:0.2.